

MR2685-105

Appl. No. 10/014,550

Amendment dated 17 December 2003

Responsive to Office Action of 1 October 2003

**AMENDMENTS TO THE CLAIMS**

The following listing of claims will replace all prior versions, and listing of claims in the application:

**LISTING OF CLAIMS:**

Claim 1 (Currently amended): A method for preparing a thin fiber-structured polymer web, comprising the steps of:

dissolving a polymer in a volatile solvent used as a polymer solvent to prepare a polymer solution;

spinning the polymer solution by electrospinning;

compulsorily discharging air containing a large amount of the solvent externally while injecting air into a working space during the electrospinning; and

forming a thin fiber-structured polymer web cumulated on a collector.

Claim 2 (Original): The method as claimed in claim 1, wherein the volatile solvent is at least one having a high volatility selected from the group consisting of acetone, chloroform, ethanol, isopropanol, methanol, toluene, tetrahydrofuran, water, benzene, benzyl alcohol, 1,4-dioxane, propanol, carbon tetrachloride, cyclohexane, cyclohexanone, methylene chloride, phenol, pyridine, trichloroethane and acetic acid.

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**Claim 3 (Original):** The method as claimed in claim 1, wherein the volatile solvent is a mixed solvent comprising at least one relatively high-volatility solvent and at least one relatively low-volatility solvent, the relatively high-volatility solvent being selected from the group consisting of acetone, chloroform, ethanol, isopropanol, methanol, toluene, tetrahydrofuran, water, benzene, benzyl alcohol, 1,4-dioxane, propanol, carbon tetrachloride, cyclohexane, cyclohexanone, methylene chloride, phenol, pyridine, trichloroethane and acetic acid, the relatively low-volatile solvent being selected from the group consisting of N,N-dimethyl formamide (DMF), dimethyl sulfoxide (DMSO), N,N-dimethylacetamide (DMAc), 1-methyl-2-pyrrolidone(NMP), ethylene carbonate (EC), propylene carbonate (PC), dimethyl carbonate (DMC), acetonitrile (AN), N-methylmorpholine-N-oxide, butylene carbonate (BC), 1,4-butyrolactone (BL), diethyl carbonate (DEC), diethylether (DEE), 1,2-dimethoxyethane (DME), 1,3-dimethyl-2-imidazolidinone (DMI), 1,3-dioxolane(DOL), ethyl methyl carbonate (EMC), methyl formate (MF), 3-methyloxazolidin-2-on (MO), methyl propionate (MP), 2-methyletetrahydrofurane (MeTHF) and sulpholane (SL).

**Claim 4 (Original):** The method as claimed in claim 1, wherein the relative humidity in a working space for the electrospinning is 0 to 40 %.

**Claim 5 (Original):** The method as claimed in claim 1, wherein the temperature of the polymer solution during the electrospinning is in the range from 40 °C to the boiling point of the solvent.

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**Claim 6 (Original):** The method as claimed in claim 1, wherein the content of the polymer used in the preparation of the polymer solution is 0.1 to 40 wt.% based on the content of the solvent.

**Claim 7 (Original):** The method as claimed in claim 1, wherein the polymer is selected from the group consisting of poly(vinylidene fluoride) (PVDF), poly(vinylidene fluoride-co-hexafluoropropylene), polyacrylonitrile, poly(acrylonitrile-co-methacrylate), polymethylmethacrylate, polyvinylchloride, poly(vinylidenechloride-co-acrylate), polyethylene, polypropylene, nylon12, nylon-4,6, aramid, polybenzimidazole, polyvinylalcohol, cellulose, cellulose acetate, cellulose acetate butylate, polyvinyl pyrrolidone-vinyl acetates, poly(bis-(2-(2-methoxyethoxyethoxy)phosphazene) (MEEP), poly(propyleneoxide), poly(ethylene imide) (PEI), poly(ethylene succinate), polyaniline, poly(ethylene sulphide), poly(oxymethylene-oligo-oxyethylene), SBS copolymer, poly(hydroxy butyrate), poly(vinyl acetate), poly(ethylene terephthalate), poly(ethylene oxide), collagen, poly(lactic acid), poly(glycolic acid), poly(D,L-lactic-co-glycolic acid), polyarylates, poly(propylene fumarates), poly(caprolactone), biopolymer, coal-tar pitch, petroleum pitch, or copolymer of them, or blend of more than two of them.

**Claim 8 (Original):** The method as claimed in claim 7, wherein the polymer is mixed with an emulsion, or an organic or inorganic powder.

**Claim 9 (Original):** The method as claimed in claim 1, wherein the collector is an anode comprising at least one selected from the group consisting of

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LiCoO<sub>2</sub>, LiMn<sub>2</sub>O<sub>2</sub>, LiMn<sub>2</sub>O<sub>4</sub>, LiNiO<sub>2</sub>, LiCrO<sub>2</sub>, LiVO<sub>2</sub>, LiFeO<sub>2</sub>, LiTiO<sub>2</sub>, LiScO<sub>2</sub>, LiYO<sub>2</sub>, LiNiVO<sub>4</sub> LiNiCoO<sub>2</sub>, V<sub>2</sub>O<sub>5</sub> and V<sub>6</sub>O<sub>13</sub>; or a cathode comprising at least one selected from the group consisting of a carbon material including graphite, cokes or hard carbon, tin oxide, lithium compound of these materials, metal lithium and metal lithium alloy.

Claim 10 (Original): The method as claimed in claim 1, wherein the collector has its upper part provided with a filtering medium.

Claim 11 (Cancelled).

Claim 12 (Original): A thin fiber-structured polymer web obtained by the method according to claim 1.

Claim 13 (Original): A filter obtained by laminating the thin fiber-structured polymer web manufactured by the method according to claim 1.